

WHAT IS CLAIMED IS:

- 1 1. An electronic key system for a vehicle
2 comprising:
3 an electronic key having first ID
4 (identification data), second ID, and third ID which
5 is shorter in data length than the second ID, said
6 electronic key outputting the first ID, the second
7 ID, and the third ID; and
8 an on-vehicle apparatus communicating with said
9 electronic key by means of wireless communication,
10 said on-vehicle apparatus having fourth ID, fifth ID,
11 and sixth ID which is shorter in data length than
12 the fifth ID, said on-vehicle apparatus permitting
13 starting an engine of the vehicle when one of first
14 and second conditions is achieved, the first
15 condition including a condition that the second ID
16 outputted from said electronic key corresponds with
17 the fifth ID, the second condition including a
18 condition that the first ID outputted from said
19 electronic key corresponds with the fourth ID and
20 the third ID outputted from said electronic key
21 corresponds with the sixth ID.
- 1 2. The electronic key system as claimed in claim 1,
2 wherein said on-vehicle apparatus permits unlocking
3 a vehicle door when the first ID corresponds with
4 the fourth ID.
- 1 3. The electronic key system as claimed in claim 1,
2 wherein said on-vehicle apparatus requests said
3 electronic key to output the first ID when an
4 operator carrying said electronic key executes an
5 operation for opening a vehicle door from an outside

6 of the vehicle.

1 4. The electronic key system as claimed in claim 3,
2 wherein said electronic key outputs the first ID
3 only when said on-vehicle apparatus requests said
4 electronic key to output ID for opening the
5 vehicular door.

1 5. The electronic key system as claimed in claim 1,
2 wherein said on-vehicle apparatus requests said
3 electronic key to output the first ID when an
4 operator carrying said electronic key approaches the
5 vehicle to open the vehicular door.

1 6. The electronic key system as claimed in claim 1,
2 wherein said on-vehicle apparatus requests said
3 electronic key to output the second ID when an
4 operator carrying said electronic key executes an
5 operation for starting the engine.

1 7. The electronic key system as claimed in claim 6,
2 wherein said electronic key outputs the second ID
3 only when said on-vehicle apparatus requests said
4 electronic key to output ID for starting the engine.

1 8. The electronic key system as claimed in claim 2,
2 wherein said on-vehicle apparatus requests said
3 electronic key to output the third ID when the first
4 ID corresponds with the fourth ID and when an
5 operator carrying said electronic key executes an
6 operation for starting the engine.

1 9. The electronic key system as claimed in claim 8,

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2 said electronic key outputs the third ID only when
3 said on-vehicle apparatus requests said electronic
4 key to output the third ID.

1 10. The electronic key system as claimed in claim 1,
2 wherein the vehicular door has a key cylinder and is
3 unlocked by inserting a key into the key cylinder
4 and by turning the key, said on-vehicle apparatus
5 permitting starting the engine when the vehicle door
6 is unlocked by turning the key inserted in the key
7 cylinder and when the second ID outputted from said
8 electronic key corresponds with the fifth ID.

1 11. The electronic key system as claimed in claim 1,
2 wherein said on-vehicle apparatus comprises an
3 antenna through which said on-vehicle apparatus
4 communicates with said electronic key located within
5 a predetermined area outside of the vehicle.

1 12. The electronic key system as claimed in claim 1,
2 wherein the third ID is a part of the second ID, and
3 the sixth ID is a part of the fifth ID.

1 13. A method for permitting starting an engine of a
2 vehicle, said method comprising:
3 checking whether first ID (identification data)
4 outputted from an electronic key corresponds with
5 first apparatus ID registered in an on-vehicle
6 apparatus;
7 permitting unlocking a vehicular door when the
8 first ID corresponds with the first apparatus ID;
9 requesting the electronic key to output second
10 ID when the first ID does not correspond with the

11 first apparatus ID;
12 checking whether the second ID corresponds with
13 second apparatus ID registered in the on-vehicle
14 apparatus;
15 permitting starting the engine of the vehicle
16 when the second ID corresponds with the second
17 apparatus ID;
18 requesting the electronic key to output third
19 ID, which is shorter in data length than the second
20 ID, when the first ID corresponds with the first
21 apparatus ID;
22 checking whether the third ID corresponds with
23 a third apparatus ID registered in the on-vehicle
24 apparatus; and
25 permitting starting the engine when the third
26 ID corresponds with the apparatus third ID.

1 14. The method as claimed in claim 13, wherein said
2 requesting the electronic key to output the second
3 ID is executed when an operation for starting the
4 engine is executed without checking the first ID.

1 15. An electronic key system for a vehicle
2 comprising:
3 an electronic key having first ID
4 (identification data) and second ID, said electronic
5 key outputting the first ID, the second ID and a
6 part of the second ID according to a request; and
7 an on-vehicle apparatus communicating with said
8 electronic key by means of wireless communication,
9 said on-vehicle apparatus having third ID and fourth
10 ID, said on-vehicle apparatus requesting said
11 electronic key to output the part of the second ID

12 when the first ID outputted from said electronic key
13 corresponds with the third ID, said on-vehicle
14 apparatus permitting starting an engine of the
15 vehicle when the part of the second ID outputted
16 from said electronic key corresponds with a part of
17 the fourth ID.

1 16. An electronic key system for a vehicle
2 comprising:
3 an electronic key having first ID
4 (identification data), second ID, and third ID which
5 is shorter in data length than the second ID, said
6 electronic key outputting the first ID, the second
7 ID and the third ID; and
8 an on-vehicle apparatus communicated with said
9 electronic key by means of wireless communication,
10 said on-vehicle apparatus having fourth ID and fifth
11 ID, said on-vehicle apparatus deciding to start an
12 engine of the vehicle when the first ID outputted
13 from said electronic key corresponds with the fourth
14 ID and when the third ID outputted from said
15 electronic key corresponds with a part of the fifth
16 ID.